SECTION 3

RESOURCE INFORMATION AND AGENCY PROGRAM UPDATES

The tables in this section summarize fiscal information of the federal government for Fiscal Years (FY) 1997 and 1998. The funds shown are those used to provide meteorological services and associated supporting research that has as its immediate objective the improvement of these services. Fiscal data are current as of the end of June 1997 and are subject to later changes. The data for FY 1998 do not have legislative approval and do not constitute a commitment by the United States Government. The budget data are prepared in compliance with Section 304 of Public Law 87-843, in which Congress directed that an annual horizontal budget be prepared for meteorological programs conducted by the federal agencies.

AGENCY OBLIGATIONS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH

Table 3.1 contains fiscal information, by agency, for meteorological operations and supporting research. The table shows the funding level for FY 1997 based on Congressional appropriations, the budget request for FY 1998, the percent change, and the individual agencies' percent of the total federal funding for FY 1997 and FY 1998.

DEPARTMENT OF AGRICULTURE (USDA)

The USDA budget request for FY 1998 is $28.14 million for operations and supporting research and represents a 2.1 percent increase from the requested FY 1997 funding level of $27.57 million. The USDA assists the Department of Commerce in determining farmers' needs for weather information and in disseminating the information to them. Major USDA activities related to weather observations include incremental modernization of the snow telemetry (SNOTEL) system operated by the Natural Resources Conservation Service (NRCS) and the replacement of manual fire rating stations with remote automated weather stations (RAWS) by the Forest Service. The SNOTEL and RAWS networks provide cooperative data for NOAA's river forecast activities, the irrigation water supply estimates, and Bureau of Land Management operations. The modernization of the RAWS completed the testing phase for acceptance in operations.

For supporting research, the USDA requests $15.59 million to focus on the interactions of weather and climate with plant and animal production and water resources management. The goal of supporting research is to develop and disseminate information and techniques to ensure an abundance of high-quality agricultural commodities and products while minimizing the adverse effects of agriculture on the environment. The research budget does not include the coordinated effort with EPA on ultraviolet radiation. The Forest Service supports a research program, initiated in 1988, for a long-term monitoring network to assess potential effects of global climate change and variability on forest health and productivity. Work also continues in forestry ecological systems modeling.

DEPARTMENT OF COMMERCE (DOC)

All reported DOC meteorological activities are within the National Oceanic and Atmospheric Administration (NOAA). The NOAA FY 1998 total congressional request of $1.21 billion for meteorological programs represents a 1.7 percent increase over the FY 1997 appropriated funds. NOAA's FY 1998 operations and supporting research requests for each of the major line office activities are described below:

Weather Services. Funding levels for FY 1998 will decrease by 305 positions and $10.0 million as part of the transition to the modernized office structure. Operations support funds of $450.8 million (a 2.2 percent decrease over FY 1997) are programmed to operate the Weather Surveillance Radar-1988 Doppler (WSR-88D) or NEXRAD units which significantly improve severe weather warning capabilities; to prepare for the Modernization and Associated Restructuring Demonstration (MARD); to continue Stage II staffing of Weather Forecast Offices (WFO) as the Advanced Weather Interactive Processing Systems (AWIPS) are deployed; and to provide funding in support of the certification requirements of Public Law 102-567.

NOAA continues to modernize the NWS by acquiring technologically advanced systems. This approach is consistent with the goal of providing more timely and accurate warning and forecast services to the public and in support of the Advance Short-Term Warning and Forecast Services goal of NOAA's Strategic Plan. A net increase of $14.4 million is requested for this sub activity.

TABLE 3.1 METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH COSTS*, BY AGENCY

(Thousands of Dollars)

	Operations			% of FY98	Supporting Research			% of FY98	Total			% of FY97	% of FY98
AGENCY	FY97	FY98	%CHG	TOTAL	FY97	FY98	%CHG	TOTAL	FY97	FY98	%CHG	TOTAL	TOTAL
Agriculture	12105	12553	3.7	0.6	15467	15591	0.8	4.5	27572	28144	2.1	1.2	1.2
Commerce/NOAA	1101079	1132490	2.9	55.9	91002	80240	-11.8	22.9	1192081	1212730	1.7	51.1	51.0
Defense(Subtot)	420412	434746	3.4	21.4	85803	78558	-8.4	22.4	506215	513304	1.4	21.7	21.6
Air Force	259535	265357	2.2	13.1	41961	39734	-5.3	11.3	301496	305091	1.2	12.9	12.8
DMSP**	42424	41973	-1.1	2.1	17964	14076	-21.6	4.0	60388	56049	-7.2	2.6	2.4
Navy	96263	107633	11.8	5.3	11786	11985	1.7	3.4	108049	119618	10.7	4.6	5.0
Army	22190	19783	-10.8	1.0	14092	12763	-9.4	3.6	36282	32546	-10.3	1.6	1.4
Interior/BLM	800	800	0.0	0.0	0	0	0.0	0.0	800	800	0.0	0.0	0.0
Transportation/CG	6774	6774	0.0	0.3	0	0	0.0	0.0	6774	6774	0.0	0.3	0.3
Transportation/FAA	408955	434763	6.3	21.4	16627	6317	-62.0	1.8	425582	441080	3.6	18.2	18.6
EPA	0	0	0.0	0.0	5700	5700	0.0	1.6	5700	5700	0.0	0.2	0.2
NASA	4903	4459	-9.1	0.2	162700	163750	0.6	46.8	167603	168209	0.4	7.2	7.1
NRC	364	298	-18.1	0.0	0	0	0.0	0.0	364	298	-18.1	0.0	0.0
TOTAL	1955392	2026883	3.7	100.0	377299	350156	-7.2	100.0	2332691	2377039	1.9	100.0	100.0
% of FY TOTAL	83.8%	85.3%			16.2%	14.7%			100.0%	100.0%			

*The FY 1997 funding reflects Congressionally appropriated funds; the FY 1998 funding reflects the amount requested in the President's FY 1998 budget submission to Congress.

**DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

Specifically in FY 1998, NWS requests a decrease of $2.2 million for the NEXRAD acquisition program. This decrease reflects near completion of NEXRAD system acquisition. The NEXRAD network will provide nationwide Doppler radar coverage, improve detection of severe weather and floods, reduce false alarm rates, increase warning lead times, and replace the existing obsolete radar network. The FY 1998 funding for the ASOS program decreases by $0.2 million as the full-scale production phase and production improvement activities continue. This decrease represents near completion of ASOS acquisition. Funding is required to operate and maintain the current network of ASOS systems and continue planned product improvements.

The FY 1998 budget request includes an increase of $16.9 million for the AWIPS to continue critical software development activities and proceed with nationwide deployment of the AWIPS system. For the first time, AWIPS will integrate satellite and radar data and provide the local forecaster a capability that will significantly improve forecasts and warnings. In addition to supporting the re-mapping of GOES data, AWIPS will provide the communications capability needed to allow internal and external users access to much of NOAA's real-time environmental data. In addition, NWS request a $0.1 million decrease for the Central Computer Facility budget to reflect a decreased annual payment toward the Cray J-916 systems buyout, the continuing lease and maintenance of the Cray C-90 supercomputer, and the completion of the NWS telecommunications gateway upgrade.

Environmental Satellite, Data, and Information Services. Proposed funding for FY 1998 includes a decrease in the Polar-Orbiting Satellite Program of $41.9 million and an increase in the Geostationary Satellite Program of $66.2 million. These changes allow for continuation of procurements to provide the spacecraft and instruments, launch services, and ground systems necessary to assure continuity of environmental satellite coverage. The FY 1998 budget request will maintain a system of polar-orbiting satellites that obtains global data and a system of geostationary satellites that provides near continuous observations of the Earth's western hemisphere. Funding is included for NOAA's share of the converged NOAA and Department of Defense (DOD) polar-orbiting system that will replace the current NOAA series and the DOD Defense Meteorological Satellite Program (DMSP) in the year 2007.

A reduction of $0.2 million is requested to continue the Ocean Remote Sensing Program which began in FY 1995. During the next several years, NOAA will acquire data from foreign and other non-NOAA satellites that will provide measurement of ocean currents, surface winds and waves, subsurface temperature and salinity profiles, ice thickness and flows, and other marine factors.

Decreases totaling $0.7 million are included to maintain basic mission services, including maintenance and operation of satellite ground facilities, provision of satellite-derived products, and conduct of research to improve the use of satellite data.

An increase of $3.0 million is requested to continue implementation of the NOAA Virtual Data System (NVDS). This system will modernize existing data storage and retrieval systems, and vastly improve, streamline, and simplify customer access to environmental data. A decrease of $4.0 million is requested for the operation of the three NOAA data centers and environmental data management modernization programs. This reductions will be partially offset by increases in data sales.

Weather Research. Requested funding for FY 1998, which includes Solar Terrestrial Services and Research, is $43.5 million--the same level as FY 1997. Covering inflationary cost increases will negatively impact the production of base programs which are described in Appendix A.

DEPARTMENT OF DEFENSE (DOD)

The DOD total budget request for FY 1998 is $513.3 million. This total represents a 1.4 percent increase in the funding level from FY 1997. Specific highlights for each of the military departments are described below:

U.S. Air Force

U.S. Air Force resources for meteorological support fall under four categories: general operations, general supporting research, DMSP operations, and DMSP and National Polar-orbiting Operational Environmental Satellite System (NPOESS) supporting research. The Air Force request (including DMSP) for FY 1998 is $361.1 million.

General Operations. The operations portion of the FY 1998 budget request is $247.3 million and represents a large portion of the environmental support to the DOD. These funds will pay for weather and space environmental support to the USAF (both active duty and reserve components), the U.S. Army, nine unified

commands, and other agencies as directed by the Chief of Staff of the Air Force. Over 3,400 people conduct these activities at over 200 worldwide locations. These people include active duty military, Air Force reservists, Air National Guard weather flight personnel, weather communications and computer specialists, and civilians. General operations funds pay the salaries of these people providing weather support, and the day-to-day operations and maintenance costs for the support they provide.

General Supporting Research. The FY 1998 budget request for Air Force supporting research is $39.7 million. The Air Force continues R&D efforts for the Cloud Depiction and Forecast System II (CDFS II) and the Global Theater Weather Analysis and Prediction System (GTWAPS), and begins R&D efforts for the Tactical Weather Radar (TWR). CDFS II will expand the computer processing capability of the current CDFS at AFGWC and will build a high resolution, worldwide cloud database by enabling the ingest and exploitation of all weather satellite and sensor data received at AFGWC. GTWAPS will provide AFGWC and the DOD a theater modeling capability to support the warfighters. A variety of other research efforts will investigate the electrodynamics of the Sun and Earth's magnetosphere, ionospheric dynamics, mesoscale meteorology, visible and infrared properties of the environment, and cloud parameterization and prediction.

DMSP Operations. Though funding for DMSP comes from the Air Force, this system is the major source of space-borne meteorological data for the military services and other high-priority DOD programs. Through the shared processing program, the DOD provides environmental data from DMSP sensors to the NWS via the network hub at the National Environmental Satellite, Data, and Information Service, and to the Navy via the network hubs at the Fleet Numerical Meteorology and Oceanography Center (FNMOC) and the Naval Oceanographic Office (NAVOCEANO).

The operations portion of the FY 1998 budget request is $42 million. The major portion of this funding is for on-orbit operations, tactical terminal procurement, and satellite sensor integration. These funds also pay operations costs for one dedicated command and control facility. DMSP funds for 217 military and civilian personnel associated with the operation of, and to a much smaller extent, the procurement of the DMSP system.

DMSP and NPOESS Supporting Research. The FY 1998 budget for DMSP R&D is $14.1 million. The funds will be used for launch vehicle integration; system integration and testing; and mission sensor calibration, validation, and algorithm development efforts. The FY 1998 DOD R&D budget for NPOESS is $29 million. FY 1998 funds will be used for system architecture studies, independent risk reduction and technology development efforts, and to begin critical sensor and algorithm development. NPOESS is scheduled to be available in 2007 as a backup to the final launch of the NOAA polar-orbiting satellites and DMSP satellites. This system will exploit advanced hardware and software technologies to produce a more reliable, longer-lived spacecraft with greater mission capability.

U.S. Navy

The U. S. Navy FY 1998 budget request for meteorological programs is $120 million. The request includes $108 million for operational programs and $12 million for supporting research.

Operations Support. Operational support for the Navy and Marine Corps includes the day-to-day provision of meteorological and oceanographic (METOC) products and services. Naval METOC support continues to evolve with the shift in United States military operational focus to expeditionary forces support. As Naval operations in the littoral increase, Navy and Marine Corps METOC support is being focused on providing on-scene capabilities for personnel that directly furnish environmental data to sensors and weapons planning and employment systems.

In addition to aviation and marine METOC support, the Navy provides a variety of unique services on demand, such as electro-optical and acoustic propagation models and products, METOC-sensitive tactical decision aids, and global sea ice analyses and forecasts. The primary program direction continues to be improvements in data collection and processing capabilities for on-scene METOC support in the littoral zones.

Systems Acquisition. Major systems undergoing procurement or upgrades include:

- Naval Integrated Tactical Environmental System (NITES) -- a collection of five METOC subsystems:
  --Tactical Environmental Support System (TESS(3)/NC)
  --Joint TESS Remote Workstation (J-TRWS) and Joint METOC Segment (JMS)
  --METOC Integrated Data Display System (MIDDS)
  --Interim Mobile Oceanography Support System (I-MOSS)

--Allied Environmental Support System (AESS)
- Primary Oceanographic Prediction System (POPS) at FLENUMMETOCCEN
- USMC Meteorological Mobile Facility (Replacement) (METMF(R))

Research and Development (R&D). This area is not generally system-specific; instead, Navy R&D efforts typically have applications to one or more meteorological, oceanographic, or tactical system(s). Navy's tabulation of these data includes R&D funding for exploratory research, demonstration, validation, engineering, and manufacturing development.

Initiatives of the Navy and Marine Corps, under sponsorship of the Oceanographer of the Navy, transition projects from exploratory development to operational Naval systems. Such efforts include advances in the Navy's numerical METOC forecasting capability, expansion in communications and data compression techniques, further development and improvement of models to better predict METOC parameters in littoral regions, and an improved understanding of the impact these parameters have on sensors, weapon systems, and platform performance.

U.S. Army

The U.S. Army is requesting $19.7 million for operational support and $12.7 million in research and development in FY 1998. Operational support decreased by $2.4 million or about 10 percent from FY 1997 funding levels. Operational manning will stay about the same at just over 300 with the majority in artillery support. Operational meteorological support at the test ranges and research and development facilities stays about the same in FY 1998 as in FY 1997. Major decreases in weather support programs and manpower, experienced over the past several years, has leveled off in FY 1998.

The Field Artillery Meteorological Hydrogen Generator (MHG) program was completed in FY 1997. The Meteorological Measuring System (MMS) was also completed in FY 1997 but will under go modifications in FY 1998 to be able to use Global Positioning System (GPS) radiosondes. Cost to modify systems within the Training and Doctrine Command (TRADOC) will be $0.9 million. The Integrated Meteorological System (IMETS) continued fielding in FY 1997 with Block II systems scheduled for fielding in FY 1998 at a cost of $1.4 million. Upgrades of previously fielded Block I IMETS to Block II capabilities and other product improvements will follow after FY 1998. The Army Authorized Objective is one IMETS for each Army echelon with an assigned Air Force Weather Team, but is resource constrained at this time. The Communications and Electronics Command (CECOM), Intelligence and Electronic Warfare (IEW) Directorate supports the CECOM Level II manager and the Project Director, IMETS with technical management of programs under their control. The funding for IEW Directorate internal support in FY 98 is $0.5 million.

TRADOC support costs in FY 1998 include the services and repairs for computerized training devices in upper air artillery training programs. These costs were not previously included. TRADOC expenditures across the command were down from $3.8 million in FY 1997 to $2.7 million in FY 1998 with a reduction in costs associated with the completion of the MMS program. U.S. Army Pacific Command (USARPAC) will have a small increase in costs associated with new, direct Staff Weather Officer (SWO) support to U.S. Army, Japan starting in FY 1998. U.S. Army Europe (USAREUR) and Seventh Army will have a small increase in funding primarily to lease weather satellite receivers.

In operational support for Research, Development Test and Evaluation (RDTE), Army Matériel Command funding for the Test and Evaluation Command (TECOM) Meteorological Teams (MET) in FY 1997 was $6.7 million for basic operations supporting 10 Army test ranges and R&D sites, with one site closing during the year. FY 1998 funding is $6.8 million. TECOM MET Teams now operate on a 60/40 percent consumer reimbursable/direct funding basis. Meteorological instrumentation for TECOM MET Teams operations will be acquired through other Army technical development resources or through direct funding from RDTE projects for test specific or unique requirements rather than from mission funds.

In meteorological R&D, the Army Research Laboratory (ARL), Battlefield Environment (BE) Division moved its basic meteorological research from White Sands Missile Range, New Mexico to the ARL Laboratory Center, Adelphi, Maryland in FY 1997. Basic research stays about constant from FY 1997 to 1998 at $3.6 million. Applied research associated with Weather Exploitation and Artillery Meteorology branches at White Sands Missile Range decreases from $6.1 million in FY 1997 to $5.5 million in FY 1998.

Other meteorological research at the Army Research Office (ARO), Corps of Engineers laboratories and centers, and the U.S. Army Research Institute of Environmental Medicine remain small programs with only minor changes in funding from FY 1997 to 1998.

DEPARTMENT OF THE INTERIOR (DOI)

The DOI funding request for FY 1998 is $800,000. This figure is for meteorological operations and support of the Bureau of Land Management (BLM) remote sensing requirements for Remote Automatic Weather Station (RAWS) and Lightning Detection Programs. Normal operations and maintenance of the restructured RAWS program is approximately $600,000 beginning this year. (This includes personnel, vehicles per diem, normal procurement and facilities).

The BLM downsizing effort in RAWS will continue in FY 1998. Total reduction in station numbers will be by one-fourth. Continue optimization will take place over the next few years. Subsequent cost savings in operations costs will be used to replace aging equipment and upgrade sensors packages. Proposed changes in Lightning Detection operations will further reduce the out-year expenditures in this program. Coordination between DOI agencies and the USDA Forest Service regarding combined meteorological requirements for the National Wildfire support functions is ongoing. During the coming downsizing efforts, interagency RAWS replacement coordination will continue to maximize National Fire Danger Rating System (NFDRS) sampling points and minimize the total number of systems required in the West.

DEPARTMENT OF TRANSPORTATION (DOT)

The meteorological programs for the United States Coast Guard and the Federal Aviation Administration for FY 1997 and FY 1998 are described below.

U.S. Coast Guard (USCG)

All of USCG's funding for meteorological programs is for operations support. In FY 1998, the requested funding level is $6.77 million. Among the Coast Guard's activities are the collection and dissemination of meteorological and iceberg warning information for the benefit of the marine community. The Coast Guard provides coastal and marine weather observations to NOAA's NWS, radio transmission of NWS weather warnings to marine users, the use of buoy tender facilities to support the activities of the National Data Buoy Center, and the management and operation of the International Ice Patrol that provides warnings to mariners of the presence of icebergs in the North Atlantic shipping lanes.

Federal Aviation Administration (FAA)

The total FAA request for aviation weather in FY 1998 is $441.1 million for both operations and supporting research; the FAA funding for FY 1997 for aviation weather was $425.6 million. The increase in the budget is principally in operations which will rise from the appropriated $409.0 million to the requested $434.8 million. Funding for supporting research in FY 1998 will decrease about 62 percent to $6.3 million.

The FAA is principally concerned with aviation weather. The FAA role is limited to the observation and dissemination of aviation weather information and to short-range automated warnings and forecasts. FAA's aviation weather programs are directed at improving the timeliness and accuracy of weather information to the aviation user when and where it is needed. The FAA also supports research in those areas that involve improvements to the observation, data dissemination, and forecasting of aviation weather. The end users of the resulting products include pilots, dispatchers, and air traffic controllers.

The FY 1998 increases in Systems Acquisition are 4.5 percent to $103.7 million. Acquisition programs with significant increases are the Weather and Radar Processor (WARP), the Integrated Terminal Weather System (ITWS), and Automated Surface Observing System (ASOS). Lesser acquisition increases are in the Low Level Windshear Advisory System, Digital Altimeter Setting Instrument, and Next Generation Runway Visual Range. Decreases to acquisition programs are associated with completion or near completion of the programs. Appendix C contains descriptions for these systems.

Individual system acquisition and operational programs with changes greater than $2 million are listed below:

Program	Change ($ Millions)
Systems Acquisition:	
Automated Surface Observing System	9.7
Weather and Radar Processor	2.6
Terminal Doppler Weather Radar	- 2.5
Integrated Terminal Weather System	5.9
Wind Shear Processor	5.6
Operations Support:	
Flight Service Stations Operations	4.7
ASOS Back-up	10.1

The FY 1998 funding request for operational support increases by $25.3 million (6.9 percent) to $327.1 million, which reflects modest increases for leased communications, contract weather observations and certain maintenance functions; and significant increases in Flight Service Station operations and ASOS backup. The large increase in operations support are associated with FAA's broadened role and responsibility for surface observations, ASOS observer augmentation, and staffing for the Aviation Weather Division.

Supporting research funding decreases from $16.6 million in FY 1997 to $6.3 million in FY 1998. The number of personnel expected to be engaged in FAA's aviation weather program is at 3434, nearly level.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

All of the EPA'S funding of meteorological programs is for supporting research. The anticipated funding level in FY 1998 for directed meteorological research is $5.7 million which is approximately the same as the FY 1997 funding level.

However, to promote excellence in environmental science and engineering, the EPA has established a new national fellowship program and substantially increased its support for investigator-initiated research grants. The increase in funding for grants (with reliance on quality science and peer review) and for graduate fellowships (to support the education and careers of future scientists) will provide for a more balanced, long-term capital investment in improved environmental research and development.

The funding for the grants program increased from $80 million in FY 1996 to $100 million in FY 1997, and will remain at this level in FY 1998. The augmented grants program will fund research in areas including ecological assessment, air quality, environmental fate and treatment of toxic and hazardous wastes, and exploratory research. The portion of these grants that will be awarded for meteorological research during FY 1998 cannot be foreseen, but it is probable that the grant awards will increase the base amount of $5.7 million listed above for directed meteorological research.

The EPA is continuing its development and validation of air quality dispersion models for air pollutants on all temporal and spatial scales as mandated by the Clean Air Act, as amended. Research will focus on indoor, urban, mesoscale, and regional models which will be used to develop air pollution control strategies, and human and ecosystem exposure assessments. There will be increased emphasis placed on meteorological research into regional and urban formation and transport of ozone and particulate pollution in support of the proposed revisions to the National Ambient Air Quality Standards. Increased efficiency of computation and interpretation of results are being made possible by means of high performance computing and scientific visualization techniques.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

Nearly all of NASA's funding in meteorology is for supporting research. The requested funding for supporting research in FY 1998 is $163.75 million, which is virtually unchanged from the FY 1997 funding level. These funding levels are composed of the estimated meteorology share of the supporting research and analysis programs as well as Earth Observing System (EOS) and Earth Probe instruments, EOS science and EOS Data and Information Systems. The FY 1998 level reflects a near 16 percent increase in the EOS and a 4 percent decrease in the EOSDIS funding from the corresponding FY 1997 levels. The Earth Probes line for FY 1998 is nearly 29 percent lower than the FY 1997 level. This line reflects reductions due to the anticipated launch of the TRMM satellite in November 1997. This reduction is offset by a slight increase in funding for the Earth System Science Pathfinders (ESSP) program. An increase of nearly 12 percent is requested for the research and analysis programs as we approach launch activities in the EOS program.

NUCLEAR REGULATORY COMMISSION (NRC)

The NRC requested funding is for meteorological operations. The FY 1998 request is essentially unchanged from the FY 1997 request.

The meteorological support program in the United States Nuclear Regulatory Commission is focused solely on obtaining and analyzing meteorological data and information to be utilized in atmospheric transport and dispersion models used in dose projections, plume pathway characterizations, and concentration estimates related to the safe operation of nuclear facilities and the protection of public health and safety and the environment. Obtaining current, accurate, and relevant meteorological information on a real-time basis for use during emergencies is the primary consideration. The NRC budget in this area reflects this priority.

AGENCY FUNDING BY BUDGET CATEGORY

Table 3.2 depicts how the agencies plan to obligate their funds for meteorological operations broken down by "budget category." The two major categories are "Operations Support" and "Systems Acquisition." To a large degree, these categories correspond to non-hardware costs (Operations Support) and hardware costs (Systems Acquisition). For agency convenience in identifying small components that do not fit into these two major categories, a third category is added called "Special Programs." Programs that provide support to several government agencies such as the Air Force's DMSP are listed on a separate line.

Table 3.3 describes how the agencies plan to obligate their funds for meteorological supporting research according to budget categories. The agencies' supporting research budgets are subdivided along similar lines--Research and Development (non-hardware), Systems Development (hardware), and Special Programs (for those items that do not easily fit into the two major categories).

AGENCY FUNDING BY SERVICE CATEGORY

Table 3.4 summarizes how the agencies plan to obligate operational funds for basic and specialized meteorological services; Table 3.5 is a similar breakout for supporting research funds. Table 3.4 reveals that "basic" services require approximately 54 percent of the total operational costs while aviation services require about 38 percent. The remaining 8 percent is distributed among the other specialized services. The definitions of specialized and basic services are described below.

Basic Services

Basic services provide products that meet the common needs of all users and include the products needed by the general public in their everyday activities and for the protection of lives and property. "Basic" services include the programs and activities that do not fall under one of the specialized services.

Specialized Meteorological Services

Aviation Services. Those services and facilities established to meet the requirements of general, commercial, and military aviation.

Marine Services. Those services and facilities established to meet the requirements of the DOC, DOD, and DOT on the high seas, on coastal and inland waters, and for boating activities in coastal and inland waters. The civil programs which are directly related to services solely for marine uses and military programs supporting fleet, amphibious, and sea-borne units (including carrier-based aviation and fleet missile systems) are included.

Agriculture and Forestry Services. Those services and facilities established to meet the requirements of the agricultural industries and federal, state, and local agencies charged with the protection and maintenance of the Nation's forests.

General Military Services. Those services and facilities established to meet the requirements of military user commands and their component elements. Programs and services which are part of basic, aviation, marine, or other specialized services are not included.

Other Specialized Services. Those services and facilities established to meet meteorological requirements that cannot be classified under one of the preceding categories; such as, space operations, urban air pollution, global climate change, and water management.

PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS

Table 3.6 depicts agency staff resources in meteorological operations. The total agency staff resources requested for FY 1998 is 20,833. This total represents a decrease of 3.7 percent from FY 1997.

INTERAGENCY FUND TRANSFERS

Table 3.7 summarizes the reimbursement of funds from one agency to another during FY 1997. Agencies routinely enter into reimbursable agreements when they determine that one agency can provide the service more efficiently and effectively than the other. While specific amounts may vary from year-to-year, the pattern shown is essentially stable and reflects a significant level of interagency cooperation.

Department of Commerce. The NWS will reimburse DOT $25.0 million for Alaska housing utilities

TABLE 3.2 AGENCY OPERATIONAL COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

	Operations Support		Systems Acquisition		Special Programs		Total			% of FY98
AGENCY	FY97	FY98	FY97	FY98	FY97	FY98	FY97	FY98	%CHG	TOTAL
Agriculture	12105	12553	0	0	0	0	12105	12553	3.7	0.6
Commerce/NOAA	558048	546313	524981	563704	18050	22473	1101079	1132490	2.9	55.9
Defense(Subtot)	381554	400152	38739	34465	119	129	420412	434746	3.4	21.4
Air Force	242896	247344	16639	18013	0	0	259535	265357	2.2	13.1
DMSP*	26682	28528	15742	13445	0	0	42424	41973	-1.1	2.1
Navy	95606	106963	657	670	0	0	96263	107633	11.8	5.3
Army	16370	17317	5701	2337	119	129	22190	19783	-10.8	1.0
Interior/BLM	600	600	200	200	0	0	800	800	0.0	0.0
Transportation/CG	6774	6774	0	0	0	0	6774	6774	0.0	0.3
Transportation/FAA	305945	327078	99199	103676	3811	4009	408955	434763	6.3	21.4
EPA					------ Not Applicable ------					
NASA	2185	2294	1066	550	1652	1615	4903	4459	-9.1	0.2
NRC	364	298	0	0	0	0	364	298	-18.1	0.0
TOTAL	1267575	1296062	664185	702595	23632	28226	1955392	2026883	3.7	100.0
% of FY TOTAL	64.8%	63.9%	34.0%	34.7%	1.2%	1.4%	100.0%	100.0%		

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 3.3 AGENCY SUPPORTING RESEARCH COSTS, BY BUDGET CATEGORY

(Thousands of Dollars)

	Research & Development		Systems Development		Special Programs		Total			% of FY98
AGENCY	FY97	FY98	FY97	FY98	FY97	FY98	FY97	FY98	%CHG	TOTAL
Agriculture	15467	15591	0	0	0	0	15467	15591	0.8	4.5
Commerce/NOAA	61888	61326	23870	13670	5244	5244	91002	80240	-11.8	22.9
Defense(Subtot)	84144	77708	400	550	1259	300	85803	78558	-8.4	22.4
Air Force	41961	39734	0	0	0	0	41961	39734	-5.3	11.3
DMSP*	17964	14076	0	0	0	0	17964	14076	-21.6	4.0
Navy	11786	11985	0	0	0	0	11786	11985	1.7	3.4
Army	12433	11913	400	550	1259	300	14092	12763	-9.4	3.6
Interior/BLM					------ Not Applicable ------					
Transportation/CG					------ Not Applicable ------					
Transportation/FAA	15339	5672	1288	645	0	0	16627	6317	-62.0	1.8
EPA	5700	5700	0	0	0	0	5700	5700	0.0	1.6
NASA	112750	11660	49950	47150	0	0	162700	163750	0.6	46.8
NRC					------ Not Applicable ------					
TOTAL	295288	177657	75508	62015	6503	5544	377299	350156	-7.2	100.0
% of FY TOTAL	78.3%	50.7%	20.0%	17.7%	1.7%	1.6%	100.0%	100.0%		

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 3.4 AGENCY OPERATIONAL COSTS, BY SERVICE

(Thousands of Dollars)

AGENCY	Basic Meteorology FY97	Basic Meteorology FY98	Aviation FY97	Aviation FY98	Marine FY97	Marine FY98	Agriculture & Forestry FY97	Agriculture & Forestry FY98	General Military FY97	General Military FY98	Other FY97	Other FY98	Total FY97	Total FY98
Agriculture	0	0	0	0	0	0	12105	12553	0	0	0	0	12105	12553
Commerce/NOAA	1043983	1075394	35596	35596	19000	19000	0	0	0	0	2500	2500	1101079	1132490
Defense(Subtot)	16716	18298	288202	299189	27444	29933	0	0	81391	80604	6659	6722	420412	434746
Air Force	0	0	259535	265357	0	0	0	0	0	0	0	0	259535	265357
DMSP*	0	0	0	0	0	0	0	0	42424	41973	0	0	42424	41973
Navy	16716	18298	28233	33366	27444	29933	0	0	18255	20364	5615	5672	96263	107633
Army	0	0	434	466	0	0	0	0	20712	18267	1044	1050	22190	19783
Interior/BLM	0	0	0	0	0	0	800	800	0	0	0	0	800	800
Transportation/CG	5730	5730	0	0	1044	1044	0	0	0	0	0	0	6774	6774
Transportation/FAA	0	0	408955	434763	0	0	0	0	0	0	0	0	408955	434763
EPA	------ Not Applicable ------													
NASA	0	0	0	0	0	0	0	0	0	0	4903	4459	4903	4459
NRC	274	208	0	0	0	0	0	0	0	0	90	90	364	298
TOTAL	1066703	1099630	732753	769548	47488	49977	12905	13353	81391	80604	14152	13771	1955392	2026883
% of FY TOTAL	54.6%	54.3%	37.5%	38.0%	2.4%	2.5%	0.7%	0.7%	4.2%	4.0%	0.7%	0.7%	100.0%	100.0%

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

TABLE 3.5 AGENCY SUPPORTING RESEARCH COSTS, BY SERVICE

(Thousands of Dollars)

	Basic Meteorology		Aviation		Marine		Agriculture & Forestry		General Military		Other		Total	
AGENCY	FY97	FY98	FY97	FY98	FY97	FY98	FY97	FY98	FY97	FY98	FY97	FY98	FY97	FY98
Agriculture	0	0	0	0	0	0	15467	15591	0	0	0	0	15467	15591
Commerce/NOAA	89377	78615	1625	1625	0	0	0	0	0	0	0	0	91002	80240
Defense(Subtot)	5564	4787	41961	39734	11786	11985	0	0	26492	22052	0	0	85803	78558
Air Force	0	0	41961	39734	0	0	0	0	0	0	0	0	41961	39734
DMSP*	0	0	0	0	0	0	0	0	17964	14076	0	0	17964	14076
Navy	0	0	0	0	11786	11985	0	0	0	0	0	0	11786	11985
Army	5564	4787	0	0	0	0	0	0	8528	7976	0	0	14092	12763
Interior/BLM	------ Not Applicable ------													
Transportation/CG	------ Not Applicable ------													
Transportation/FAA	0	0	16627	6317	0	0	0	0	0	0	0	0	16627	6317
EPA	0	0	0	0	0	0	0	0	0	0	5700	5700	5700	5700
NASA	0	0	0	0	0	0	0	0	0	0	162700	163750	162700	163750
NRC	------ Not Applicable ------													
TOTAL	94941	83402	60213	47676	11786	11985	15467	15591	26492	22052	168400	169450	377299	350156
% of FY TOTAL	25.2%	23.8%	16.0%	13.6%	3.1%	3.4%	4.1%	4.5%	7.0%	6.3%	44.6%	48.4%	100.0%	100.0%

*DMSP is the Defense Meteorological Satellite Program that supports all DOD Components and other government agencies. It is primarily funded and managed by the Air Force.

and technological advances. NASA will receive $60,000 for stratospheric studies and a total of $276.3 million for satellite acquisition and launching--polar orbiting ($63.1 million) and geostationary ($213.2 million).

Department of Defense. The Air Force will reimburse DOC a total of $4.2 million for WSR-88D Operational Support Facility support ($3.4 million), COMET participation ($5,000), OFCM support ($140,000), Share Processing Network ($139,000), and supporting research ($565,000). The Navy will reimburse DOC $100,000 for climatological analysis and forecasting. The Army reimbursements to DOC include $650,000 to maintain precipitation reporting stations and $40,000 for basic supporting research at NOAA's Environmental Technology Laboratory. The Army will also reimburse the United States Geological Survey $410,000 for operations and maintenance of hydrologic and precipitation reporting stations. Additionally, the Army will reimburse NASA's Goddard Space Flight Center $71,000 for basic supporting research. NASA will also reimburse the National Center for Atmospheric Research (NCAR) $12,000 to conduct basic supporting research.

Department of Transportation. The FAA will reimburse NOAA $14.0 million in FY 1998 for procurement of WSR-88D and ASOS systems. Additionally, NOAA will receive $17.4 million for operational support--$7 million for WSR-88D and ASOS maintenance, $7.7 million for aviation weather observations, $7.6 million for the Center Weather Service Units at all Air Route Traffic Control Centers, $1.4 million to establish the World Area Forecast System, $360,000 for meteorological instructors at the FAA Academy, and $300,000 for studies and dissemination.

The FAA will reimburse the National Science Foundation (NSF) and National Aeronautics and Space Administration (NASA) a total of $14.3 million for supporting research. The NSF will receive $13.0 million and NASA will receive $1.28 million for aeronautical hazards.

National Aeronautics and Space Administration (NASA). The Air Force will receive reimbursement of $1.1 million for observations and forecasts. NOAA's National Weather Service will receive $1.05 million for spaceflight weather support; National Data Buoy Center will receive reimbursements of $105,000 for operations of data buoys.

Environmental Protection Agency (EPA). NOAA's Air Resources Laboratory (ARL) will be reimbursed $5.1 million for development, evaluation, and application of air quality dispersion models, and for providing meteorological expertise and guidance for EPA policy development activities.

Department of Energy (DOE). The NOAA/OAR will be reimbursed $4 million to support the Nuclear Support Office at the Nevada Nuclear Test Site.

Nuclear Regulatory Commission (NRC). The NRC will reimburse NOAA's ARL ($90,000) and DOE ($64,000) for technical assistance.

FACILITIES/LOCATIONS for TAKING METEOROLOGICAL OBSERVATIONS

Table 3.8 indicates the number of facilities or platforms at which the federal agencies carry out (or supervise) the various types of weather observations.

TABLE 3.6 PERSONNEL ENGAGED IN METEOROLOGICAL OPERATIONS
(Units are Full Time Equivalent Staff Years)*

AGENCY	FY 1997	FY 1998	%CHG	% of FY 1998 TOTAL
Agriculture	98	102	4.1	0.5
Commerce/NOAA	6,184	5,876	-5.0	28.2
Reimbursed**	210	200	-4.8	1.0
Defense(Subtotal)	5,794	5,585	-3.6	26.8
Air Force	3,701	3,424	-7.5	16.4
DMSP*	283	217	-23.5	1.0
Navy	1,504	1,574	4.7	7.6
Army	306	304	-0.7	1.5
Interior/BLM	12	6	-5.0	0.0
Reimbursed**	6	4	-33.3	0.0
Transportation/CG	106	106	0.0	0.5
Transportation/FAA	3,433	3,434	0.0	16.5
EPA	0	0	0.0	0.0
NASA	0	0	0.0	0.0
NRC	1	1	0.0	0.0
TOTAL	21,638	20,833	-3.7	100.0

* Numbers of personnel are rounded to nearest whole number.
** "Reimbursed" are personnel funded by other agencies.
****

TABLE 3.7 INTERAGENCY FUND TRANSFERS FOR METEOROLOGICAL OPERATIONS AND SUPPORTING RESEARCH

Agency Funds Transferred from:	Agency Funds Transferred to:	FY 1997 Funds ($K) Estimated or Planned Operations	Supporting Research
Commerce/NOAA	DOT/USCG	2500	
	NASA Studies	60	
	NASA (Procurement)	305,202	
Defense/Air Force	DOC	3,634	565
Defense/Navy	DOC/NOAA/NCDC	100	
Defense/Army	DOC/NOAA/NWS	650	
	DOC/NOAA/ETL		40
	DOI/USGS	410	
	NASA/GSFC/GISS		48
	NASA/GSFC		23
	NSF/NCAR		12
Transportation/FAA	DOC/NOAA	17,352	
	DOC/NOAA (Procurement)	13,995	
	NSF		13,000
	NASA		1,284
NASA	DOD/USAF	1,100	
	DOD/NOAA/NWS	1,050	
	DOC/NOAA/NDBC	105	
EPA	DOC/NOAA/ARL		5,100
DOE	DOC/NOAA/OAR	4,000	
NRC	DOC/NOAA/ARL	90	
	DOE	64	

TABLE 3.8 FACILITIES/LOCATIONS for TAKING METEOROLOGICAL OBSERVATIONS

TYPE OF OBSERVATION/AGENCY	No. of Locations (FY 1997)
Surface, land	
Commerce (all types)	748
Air Force (U.S. & Overseas)	137
Navy (U.S. & Overseas)	43
Army (U.S. & Overseas)	13
Marine Corps (U.S. & Overseas)	13
Transportation (Flight Service Stn)	61
Transportation (Lim Aviation Wx Rptg Stn)	114
Transportation (Contract Wx Observing Stn)	124
Transportation (Auto Wx Observing Stn)	175
Transportation (Auto Sfc Obs Sys, fielded)	318
Transportation (USCG Coastal)	124
Interior	470
Agriculture	1080
NASA	3
Surface, marine	
Commerce (SEAS-equipped ships)	140
Commerce (Coastal-Marine Autom Network)	65
Commerce (NOAA/NOS/PORTS)	4
Commerce (Buoys--moored)	64
Commerce (Buoys--drifting)	21
Commerce (Buoys--large navigation)	10
Commerce (Water-level gauges)	189
Navy (Ships with met personnel)	27
Navy (Ships without met personnel)	325
Transportation (USCG Ships)	72
NASA	2
Upper air, balloon	
Commerce (U.S.)	86
Commerce (Foreign, cooperative)	22
Air Force, Fixed (U.S. & Overseas)	16
Air Force, Mobile	6
Army, Fixed (U.S. & Overseas)	15
Army, Mobile	52
Navy, Fixed (U.S. & Overseas)	18
Navy, Mobile	39
Navy, Ships	27
Marine Corps, Fixed (U.S. & Overseas)	1
Marine Corps, Mobile	11
NASA (U.S.)	2
Atmospheric Profilers	
Army	6

TYPE OF OBSERVATION/AGENCY	No. of Locations (FY 1997)
Upper air, rocket	
NASA	2
Air Force	2
Navy	1
Army (U.S. & Overseas)	5
Doppler weather radar (WSR-88D) sites	
Commerce (NWS)	120
Air Force	28
Army	2
Transportation	12
Off-site WSR-88D Processors (PUPs)	
Commerce (NWS)	63
Air Force	102
Navy	32
Army	3
Marine Corps	8
Transportation	25
Airport terminal Doppler weather radars	
Transportation (Commissioned)	3
Army (not airfield--Test Range)	1
Conventional radar (non-Doppler) sites	
Commerce (NWS)	31
Commerce (at FAA sites)	27
Air Force, Fixed (U.S. & Overseas)	17
Air Force, Remote Displays	4
Air Force, Mobile Units	3
Army (Overseas)	1
Navy, Fixed (U.S. & Overseas)	6
Navy, Remote displays/RADIDS	6
Marine Corps, Fixed (U.S. & Overseas)	2
Marine Corps, Mobile units	15
Weather reconnaissance (No. of aircraft)	
Commerce (NOAA)	3
Air Force Reserve (AFRES)	10
Geostationary meteorological satellites (No. operating)	
Commerce (planned config of 2)	2
Polar meteorological satellites (No. operating)	
Commerce (planned config of 2)	2
Air Force (planned config of 2)	2